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DEEP LEARNING APPROACHES TO THE CLASSIFICATION OF INDIAN CLASSICAL MUSIC

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01 Introduction

• Indian classical music represents the cultural heritage of India, reflecting the musical traditions of the Hindustani and Carnatic styles.

• The music is extraordinarily complicated and full of difference, with its constant shifts between numerous talas (rhythm cycles), ragas (stylised melodic scales) and kayas (dynamics)

• This complications makes automated systems to work very hard on going through each piece of music.

•There is no satisfactory typology available for classifying Indian classical music into proper categories which this research is aiming to address.

02 Research Questions

1. Can machine learning technologies more accurately classify Indian Classical Music?

2. What is the best deep learning architecture to classify genres, ragas and compositions in Indian classical music?

03 Literature Review

• Recent works have made use Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNN)s and LSTM in the context of music classification.

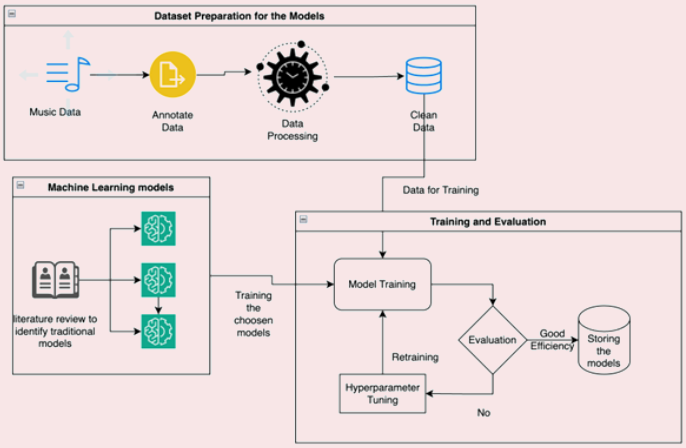
• Given how young deep learning is, it's tough to build robust large-scale models without a significant amount of training data. Unfortunately, the absence of freely available, large-scale, well-annotated datasets makes it difficult to train models specific to Indian classical music.

• Subtle tones in ragas, often inadequately captured by existing models, affect their accuracy.

• Improvements in classification performance might be available by combining different neural network architectures in new ways specially in the musical context, and the current approaches do not adequately explore this area.

• Addressing issues focusing on the performance
requires extensive training, validation and fine-tuning of the models to improve the model performance.

04 Methodology



05 Next Steps

1. As addressed in the literature review, the dataset for building the model to classify the Indian music is not available and the next important step in the research is to construct the dataset with different styles of Indian music for training the models.

2. Based on the research problem and the dataset requirements, the next step is to identify the deep learning model (such as CNNs, RNNs and Transformers) for effectively categorising the Indian music styles.

3. Building the models and refine the models through rigorous training and hyperparameter optimization. This involves adjusting model parameters to enhance performance and accuracy on the newly developed Indian music dataset.

References

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Technologies: pandas, TensorFlow, Python, scikit learn, PyCharm